

WHAT IS CLAIMED IS:

1. An output circuit, comprising:
  - a first switch for supplying a first external power to be used as a second external power or shutting off the supply of the power, according to a control signal;
  - an output buffer for outputting a signal keeping the potential of the second external power or a ground potential, depending on an input signal, an enable signal and the control signal;
  - an output driver for outputting a signal keeping the potential of the second external power or the ground potential depending on the output signal of the output buffer;
  - a second switch for allowing one of input terminals of the output driver to have the potential of the first external power according to the control signal; and
  - 15 a third switch for allowing the other of the input terminals of the output driver to have the ground potential according to the control signal.
2. The output circuit as claimed in claim 1, wherein the control signal is a signal that is applied as different potential states in a normal operating mode and a deep power down mode.
- 20 3. The output circuit as claimed in claim 1, wherein the first switch is a PMOS transistor that is driven according to the control signal.
- 25 4. The output circuit as claimed in claim 1, wherein the output buffer comprises:

a first input means for receiving the input signal and the enable signal as an input;

a second input means for receiving the input signal and the enable signal as an input;

5 a first driving means for outputting the potential of the second external power or the signal of the ground potential to a first node, according to the control signal and the output signal of the first input means; and

10 a second driving means for outputting the potential of the second external power or the signal of the ground potential to a second node, according to the control signal and the output signal of the second input means.

5. The output circuit as claimed in claim 4, wherein the first input means comprises:

15 a first inverter for inverting the input signal;

a second inverter for inverting the enable signal; and

a NOR gate for performing a NOR operation for the output signal of the first inverter and the output signal of the second inverter.

20

6. The output circuit as claimed in claim 4, wherein the second input means comprises:

an inverter for inverting the input signal; and

25 a NAND gate for performing a NAND operation for the output signal of the inverter and the enable signal.

7. The output circuit as claimed in claim 4, wherein the first driving means comprises:

1 a level shifter for outputting the potential of the second external power or the signal of the ground potential according to the output signal of  
5 the first input means;

1 a NMOS transistor connected between the output terminal of the first level shifter and the ground terminal and driven by the control signal;

1 a PMOS transistor for supplying the second external power according to the control signal; and

10 an inverter for outputting the potential of the second external power supplied through the PMOS transistor or the signal of the ground potential, according to the output signal of the first level shifter.

8. The output circuit as claimed in claim 4, wherein the second driving means comprises:

1 a level shifter for outputting the potential of the second external power or the signal of the ground potential according to the output signal of the second input means; and

20 an inverter for inverting the output signal of the level shifter to output the potential of the second external power or the signal of the ground potential.

9. The output circuit as claimed in claim 4, further comprising a NMOS transistor for keeping the potential of the input terminal of the first driving means to be the ground potential, according to the control signal.

10. The output circuit as claimed in claim 4, further comprising a NMOS transistor for keeping the potential of the input terminal of the second driving means to be the ground potential, according to the control signal.

5

11. The output circuit as claimed in claim 1, wherein the second switch comprises:

an inverter for outputting the potential of the first external power or the signal of the ground potential according to the control signal; and

10 a PMOS transistor for supplying the first external power to a first node depending on the output signal of the inverter.

12. The output circuit as claimed in claim 1, wherein the third switch is a NMOS transistor connected between a second node and the ground terminal and driven by the control signal.

15 13. An output circuit, comprising:

a first switch for supplying a first external power to be used as a second external power in a normal operating mode and shutting off the 20 supply of the power in a deep power down mode, according to a control signal;

an output buffer for outputting a signal keeping the potential of the second external power or the ground potential according to an enable signal and the control signal in the normal operating mode, wherein the output 25 buffer is floated in the deep power down mode;

an output driver for outputting a signal keeping the potential of the second external power or the ground potential according to the output signal of the output buffer in the normal operating mode;

5 a second switch for allowing one of input terminals of the output driver to have the potential of the first external power in the deep power down mode; and

a. third switch for allowing the other of the input terminals of the output driver to have the ground potential in the deep power down mode.

10 14. An output circuit, comprising:

a first switch for supplying a first external power to be used as a second external power in a normal operating mode and shutting off the supply of the power in a deep power down mode, according to a control signal;

15 a first input means for receiving a global input/output signal and an output enable signal as an input;

a second input means for receiving the global input/output signal and the output enable signal as an input;

20 a first driving means for outputting the potential of the second external power supplied through the first switch or a signal of the ground potential to a first node according to the output signal of the first input means in the normal operating mode, wherein the first driving means is floated in the deep power down mode;

25 a second driving means for outputting the potential of the second external power supplied through the first switch or the signal of the ground potential to a second node according to the output signal of the second input

means in the normal operating mode, wherein the second driving means is floated in the deep power down mode;

a second switch for supplying the first external power to the first node according to the control signal in the deep power down mode;

5 a third switch for controlling the potential of the second node to become the ground potential according to the control signal in the deep power down mode; and

an output driver for outputting the potential of the second external power supplied through the first switch or the signal of the ground potential to

10 an output terminal depending on the potential of the first node and the potential of the second node in the normal operating mode.